

**Notice of Allowability**

Application No.

10/728,462

Applicant(s)

UNTERBERGER, MICHAEL

Examiner

Barbara Summons

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-12.
3. ☒ The drawings filed on 05 December 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |                                                                                                                     |                                                                                       |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                         | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|                                                                                                                     | 9. <input type="checkbox"/> Other _____                                               |

## **EXAMINER'S AMENDMENT/REASONS FOR ALLOWANCE**

### ***Examiner's Amendment***

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Mark Bergner (Reg. No. 45,877) on March 11, 2005.

The application has been amended as follows:

### **In the Claims:**

In claim 7, on the last line thereof, "layer" has been changed to - - mirror - - (see line 2).

### ***Reasons for Allowance***

2. The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or fairly suggest a component operating with bulk acoustic waves comprising an asymmetric port and a symmetrical port (see claim 1, lines 1-3), and a second resonator stacked on top of a first resonator and acoustically coupled to the first resonator via a coupling layer system (claim 1, lines 12-14), and wherein the coupling layer system has "a compensation layer which has a thickness of  $\lambda/8$ " (claim 1, lines 9-11). The closest prior art is discussed below.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lakin U.S. 6,720,844 discloses stacked bulk acoustic wave resonators (Fig. 3) with a partially permeable coupling layer system (350, 351 and 352) of alternating high and low impedance layers between the resonators to regulate the coupling therebetween (see Fig. 8 and col. 6, lines 11-22), and wherein the inputs and outputs can be operated as either balanced or unbalanced terminals (see col. 8, lines 60-67).

Ella et al. U.S. 6,670,866 discloses stacked bulk acoustic wave resonators functioning as a balun (see Figs. 5 and 6), having one balanced/symmetric port and one unbalanced/asymmetric port, with a single dielectric layer 50 of any thickness (see e.g. col. 10, lines 22-30) between the resonators, and also discloses placing an inductor in parallel with the resonators (Fig. 6).

Lakin U.S. 6,107,721 discloses a bulk acoustic wave resonator having a compensating layer 50 (Fig. 4) that is not  $\lambda/4$  thick as part of an acoustic mirror, the layer 50 for changing the resonant frequency of the overlying resonator (see e.g. col. 3, lines 38-46).

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Weber U.S. 5,864,261 discloses bulk acoustic wave resonators that are stacked with an acoustic mirror therebetween (Fig. 5), and wherein the resonators are partially acoustically coupled by acoustic coupling plugs 150 and 151 (see col. 50-66).

Poirier et al. U.S. 3,568,108 discloses bulk acoustic wave resonators that are stacked with a partially permeable coupling layer system 51, 53 and 54 (see the abstract and col. 3, lines 55-56), but there is no layer that is  $\lambda/8$  thick.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs  
March 11, 2005



**BARBARA SUMMONS**  
**PRIMARY EXAMINER**